



Modulation of fish fibroblast proliferation with glucan and hydrogen peroxide during wound healing.

Jiménez, Natalia Ivonne Vera; Nielsen, Michael Engelbrecht

Publication date:
2012

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):

Jiménez, N. I. V., & Nielsen, M. E. (2012). *Modulation of fish fibroblast proliferation with glucan and hydrogen peroxide during wound healing.*. Poster session presented at Prebiotics and probiotics in medicine, veterinary sciences and aquaculture: the future, Keele, United Kingdom.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Modulation of fish fibroblast proliferation with β -glucan and hydrogen peroxide during wound healing.

N.I. Vera-Jiménez & M.E. Nielsen

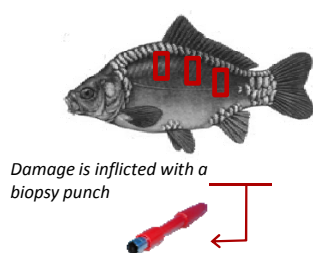
Biological Quality Research Group, National Food Institute, Technical University of Denmark

Introduction

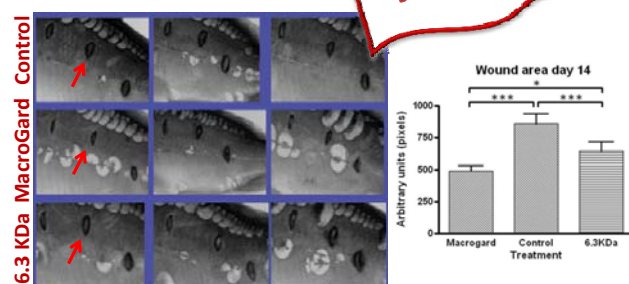
Wound healing and tissue regeneration are essential mechanisms to ensure the survival and health of any organism. Although several diseases and even mechanical injury can damage fish tissues, only a few studies have been directed to tissue regeneration and modulation of cell proliferation during wound healing in fish. Mammalian studies suggested the importance of fibroblasts, leukocytes and radical oxygen species (ROS) during tissue regeneration processes. This study is directed to their fish counterparts and their involvement during wound healing in fish.

Can we modulate tissue regeneration in fish using different β -glucans?

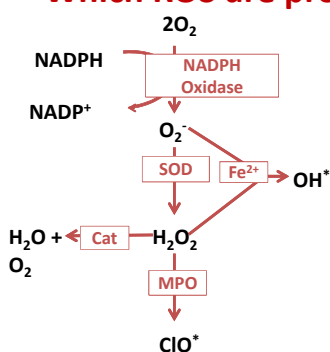
Yes, we can...



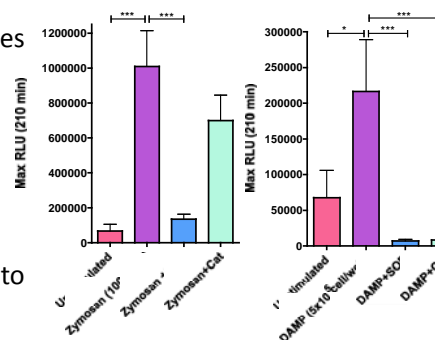
1. β -glucans bath [0.1mg/L], 14 days.
 - ❖ MacroGard®
 - ❖ PromOat 6.3KDa
2. Multispectral image (VideometerLab)



Which ROS are produced by the immune-system after recognition of β -glucans or a wound?



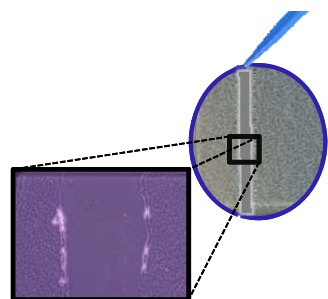
1. Head kidney derived leukocytes were cultured for 6 days
2. Stimulation of Leukocytes
 - ❖ Zymosan (100 μ g/ml)
 - ❖ DAMPs (5X10⁵ cells/well)
 - ❖ SOD (O₂⁻ scavenger)
 - ❖ Catalase (H₂O₂ scavenger)
3. Real time luminol assay was used to measure ROS.



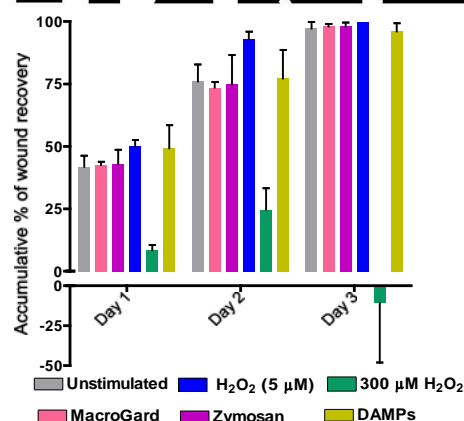
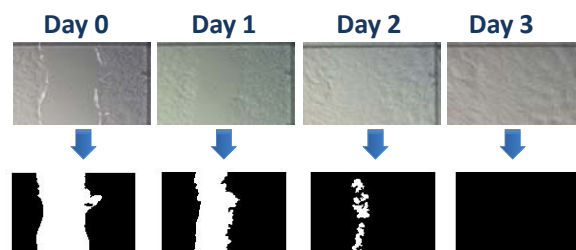
DAMP stimulation induces H₂O₂

β -glucans stimulation induces O₂⁻

Do β -glucans and H₂O₂ modulate directly fibroblast proliferation during wound healing?



1. Culture Stimulation (daily)
 - ❖ MacroGard® (100 μ g/ml)
 - ❖ Zymosan (100 μ g/ml)
 - ❖ H₂O₂ (5 μ M, 10 μ M, 300 μ M)
 - ❖ DAMPs (5X10⁵ cells/well)
2. Image analysis (MatLab)



❖ H₂O₂ can influence the rate of tissue regeneration
 ❖ β -glucan did not show a direct effect on fibroblast proliferation
 ❖ Interaction with components of the fish immune system are required to induce fibroblast proliferation using β -glucans